

caught in the Mysore State, the larger from the Cauvery River and the other from the Cubbany (Kabani) River. In view of their record size and the interest they are likely to excite among anglers, I propose to deal here with their taxonomic position and assign to them a specific name.

In part xvi of the series of articles on 'The Game Fishes of India', (*Journ., Bom. Nat. Hist. Soc.*, Vol. xlv, pp. 1-8, 1943) I have dealt with the systematic position and geographical distribution of the two species of mahseer described by Sykes (*Trans. Zool. Soc. Lond.*, Vol. ii, pp. 349-378, pls. lx-lxvii, 1941) from the Deccan. Evidence was adduced to show that the high-backed mahseer of the Deccan waters is *Barbus (Tor) mussullah* Sykes.

Jerdon (*Madras Journ. Lit. Sci.*, Vol. xv, pp. 302-346, 1849) assigned *Kilche* of the Cauvery, a fish that 'grew to an enormous size', to *Barbus megalepis* McClelland, while Thomas (*Rod in India*, 3rd Ed., pp. 22, 23, London: 1897), following the nomenclature suggested by Day (*Fish. India*, p. 573, London: 1878) named his 'Bhwanny Mahseer' or 'Bombin', a much deeper and more high-backed mahseer than the others, *Barbus tor* (Hamilton). Recent investigations have, however, definitely shown that both these forms are referable to Sykes's *B. mussullah*. The excellent photographs, reproduced in Col. Burton's article, leave no doubt that his observations deal with the high-backed mahseer of the Deccan, and, therefore, the correct scientific name of the record mahseer is *Barbus (Tor) mussullah* Sykes. The only other mahseer found in the Deccan and the Peninsular waters is *Barbus (Tor) khudree* Sykes. The difference in form of the two species is clearly shown in the coloured drawings reproduced with my article referred to above.

1, DEODAR STREET,  
BALLYGUNGE, CALCUTTA,  
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#### XVI.—STRANGE BREEDING HABITS OF THE CICHLID FISH (*ETROPLUS MACULATUS*).

Although the Cichlid family of fishes is widespread throughout the rivers of Africa and South America, the family is represented in India by only two species, both confined to 'the southern coastal belt. A difficult fish to observe, *Etroplus* does not take well to aquarium life and no *detailed* description of its strange breeding habits has come to the writer's notice.

The writer has been fortunate in that two pairs of *Etroplus maculatus* bred in his aquarium in Poona. On both occasions it was possible to observe the process in every detail. Here are the particulars:—There is a preliminary courtship in which both sexes put on the most gorgeous breeding colours—the body turns a brilliant canary yellow—the anal and ventral fins become deep

black. There is a large dark spot centrally situated on the side of the body—the eye turns red and is partially surrounded by a crescent of brilliant iridescent blue.

By nature attractive in shape, with vertically flattened body and perky fins, this fish, male and female is a really striking sight at breeding time. Having put on their wedding garments, the pair proceed to investigate the aquarium for possible enemies—other fish are pushed about and bullied no matter what their size—even the owner is not immune—a finger dipped into the aquarium invariably receives a painful nip—doubtful looking plants, possible hiding places of enemies, are investigated in detail. If suspicious, the fishes just root them up. Finally a clear belt is made round the site selected for spawning. The female now protrudes her ovipositor—rather like a small thorn near the vent. The actual site for spawning—the glass side of the aquarium is carefully picked clear of all impurities—algae and debris. Whilst the male stands guard, the female swims up to the site—she moves up vertically, her ovipositor just touching the glass and ejects a number of eggs—generally two. These eggs are dark in colour, the size of a pin's head *and are attached to the glass by a gelatinous thread approx. 2 mm. long, so that they can move freely in all directions.* Having fixed her eggs, she darts over to the male, who is on sentry-go, and gently nudges him with her snout—he turns and sails over to the spawning site, whilst she takes over the duties of sentry, facing away from her mate and exhibiting every sign of ferocity.

The male having reached the eggs, sails upwards across the site. His body trembles violently as he ejects his milt over each egg in turn. He now returns to sentry duty, whilst the female again ejects a couple more eggs. So the process goes on until approximately 150 eggs are deposited. The site chosen is in the angle of the aquarium, close to the bottom. The eggs, each anchored by an individual thread, resemble a black curtain fringe. The fishes now take it in turn to fan the eggs—For this purpose they use their pectoral fins, moving up and down over the spawning site. Whilst one fans the other does sentry-go, keeping all intruders at bay. The sentry has to be relieved at times and there never seems to be any misunderstanding about this—the fish that fans moves over, nudges its companion and takes over, whilst the relieved sentry moves back to fan the eggs. Occasionally fanning is stopped for a few moments, whilst the fish picks some algae off the glass or some debris off the bottom of the tank.

Forty-eight hours after spawning the fishes take it in turn to dig a hole in the aquarium sand. This is done very thoroughly. Quite large pebbles are rolled out—smaller ones are carried by mouth and dropped some distance away. When the hole is dug to their satisfaction, and when it has been thoroughly cleaned, one fish remains on sentry go whilst the other proceeds to the spawning site. The eggs are taken in the mouth, two or three at a time—a gentle pull releases the retaining thread—they are now carried in the mouth to the crater in the sand and gently dropped in. When all have been so transferred, the fish are much happier. The pair find it quite an easy matter to safeguard the

young by sitting on top of the hole and fanning. All the time there is a great fussiness about sanitation. Both fish constantly peck about in the sand. If debris is found, it is picked up and spat out in the far corner of the tank. The digging of holes continues daily and the eggs are constantly changed from one site to another. This extreme cleanliness is evidently intended to prevent fungus disease which would, in less clean surroundings, attack and kill the eggs.

By the end of the fourth day a constant waving motion is noticed amongst the eggs—the young are hatched out but are still attached to their yolk sacs. They look just a mass of tiny helpless creatures, scarcely recognisable as fish—the parents keep up their unremitting care, refusing ordinary food. If, however, any live insect, mosquito larvae or the like is introduced into the tank, it is immediately snapped up. They appear, at this stage, to only eat in defence of their young. Another fish of their own size or even bigger, if introduced, will be attacked viciously and killed if not removed. On the eighth day exactly, the young fish start to swim. Early efforts are supervised by the parents, who use their pectoral fins to sweep the babies gently about. Enterprising youngsters are sternly repressed. If one strays from the flock, he is seized in the parent's mouth and brought back to be spat out well into the centre of the crowd.

Each baby fish has its daily bath! This is done by the parents taking individual babies into their mouths. They are rolled round and round inside and then ejected clean as a new pin. Parents keep their young in a compact mass and cruise along the bottom of the aquarium picking at algae and turning over smaller pebbles rather in the way a hen scratches for her chickens. To keep the young alive at this stage is a problem. They must have live animalculae, minute rotifers and the like—these are obtained by sweeping a net of fine bolting cloth in any neighbouring pool—the dirtier the better! Infusoria of this nature when introduced into the aquarium look like minute specks of dust. The young eagerly devour them and grow rapidly. Certain types of animalculae seem to be not good for the children, so are disposed of by the parents. Throughout this period the parents retain their beautiful colours and are most affectionate. One often sees them gently rubbing sides, the nearest they can go to a caress. They appear so proud of their children—so ready to give their lives if necessary in their defence—so keen on cleanliness and the health of the babies—True exponents of infant welfare. Every item set forth above has been seen and noted at the time by the writer. Apart from whatever addition it may make to the knowledge of the breeding habits of our Indian fishes, it has been a delightful experience for the observer.

GANESHKHAND, POONA,

June 1, 1943.

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